United States Department
of Agriculture

Chico Watershed

Hydrologic Unit Code 11020004

Natural Resources
Conservation Service

Lakewood, Colorado

Rapid Assessment

RWA 11020004

April 2008

Satellite Imagery: ArcIMS Server - Geographic Network Services hosted by ESRI

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Introduction

Background Information

The Natural Resources Conservation Service (NRCS) is encouraging the development of rapid watershed assessments in order to increase the speed and efficiency generating information to guide conservation implementation, as well as the speed and efficiency of putting it into the hands of local decision makers.

Rapid watershed assessments provide initial estimates of where conservation investments would best address the concerns of landowners, conservation districts, and other community organizations and stakeholders. These assessments help land-owners and local leaders set priorities and determine the best actions to achieve their goals.

Benefits of these Activities

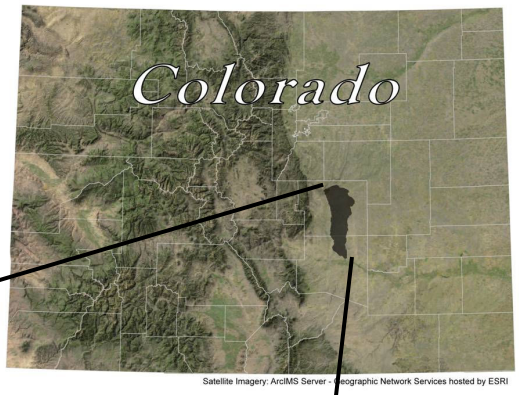
While rapid assessments provide less detail and analysis than full-blown studies and plans, they do provide the benefits of NRCS locally-led planning in less time and at a reduced cost. The benefits include:

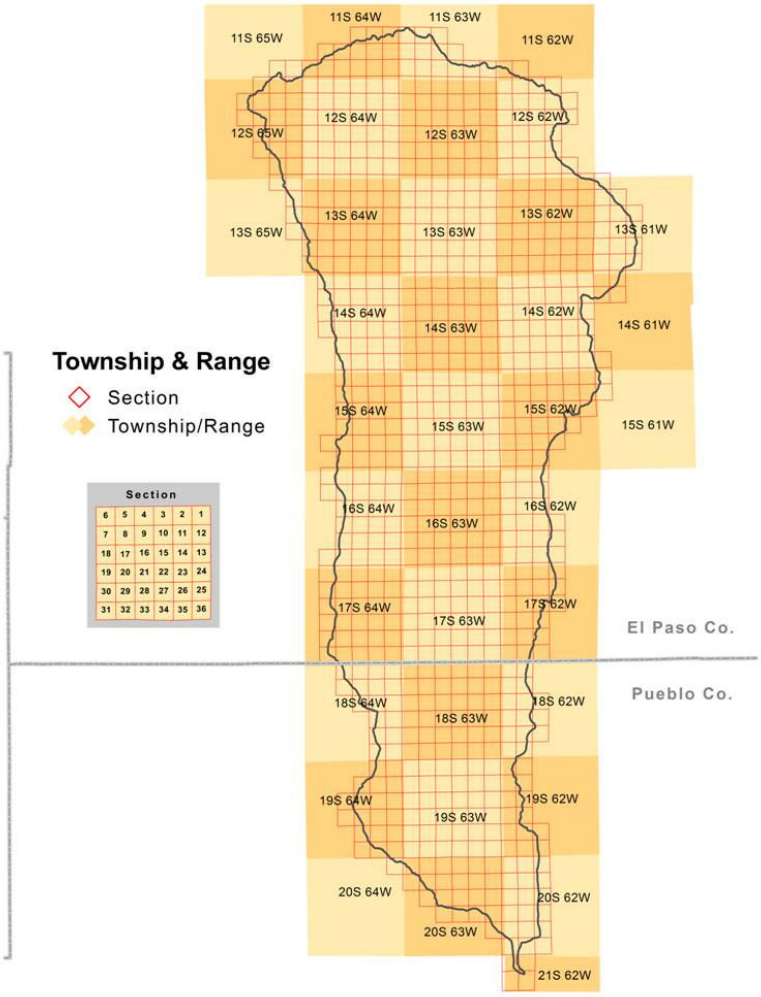
- Quick and inexpensive tools for setting priorities and taking action
- Providing a level of detail that is sufficient for identifying actions that can be taken with no further watershed-level studies or analyses
- Actions to be taken may require further Federal or State permits or ESA or NEPA analysis but these activities are part of standard requirements for use of best management practices (BMPs) and conservation systems
- Identifying where further detailed analyses or watershed studies are needed
- Plans address multiple objectives and concerns of landowners and communities
- Plans are based on established partnerships at the local and state levels
- Plans enable landowners and communities to decide on the best mix of NRCS programs that will meet their goals
- Plans include the full array of conservation program tools (i.e. cost-share practices, easements, technical assistance)

Rapid Watershed Assessments provide information that helps land-owners and local leaders set conservation priorities.

Watershed Overview

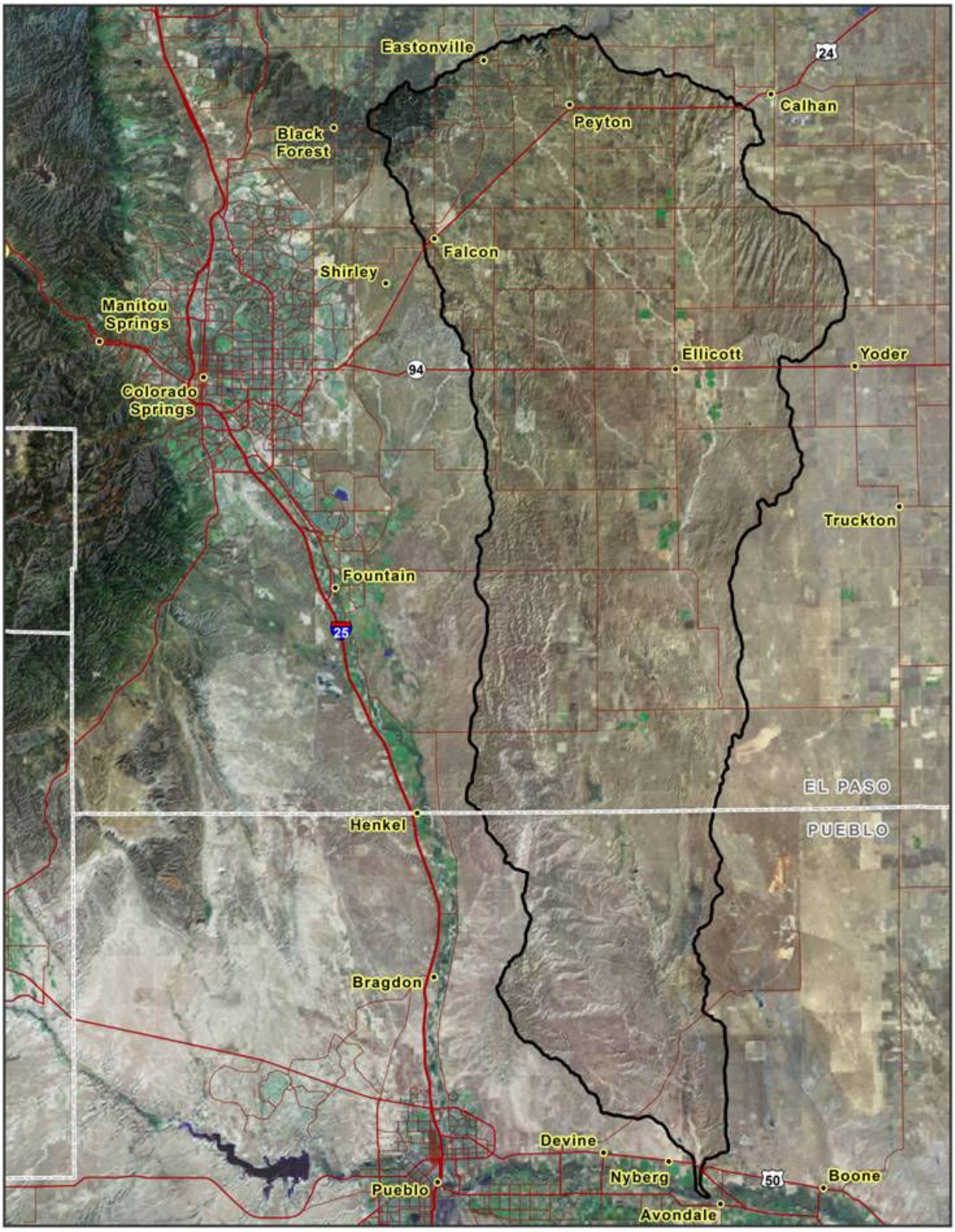
The Chico Watershed is located in Pueblo and El Paso county

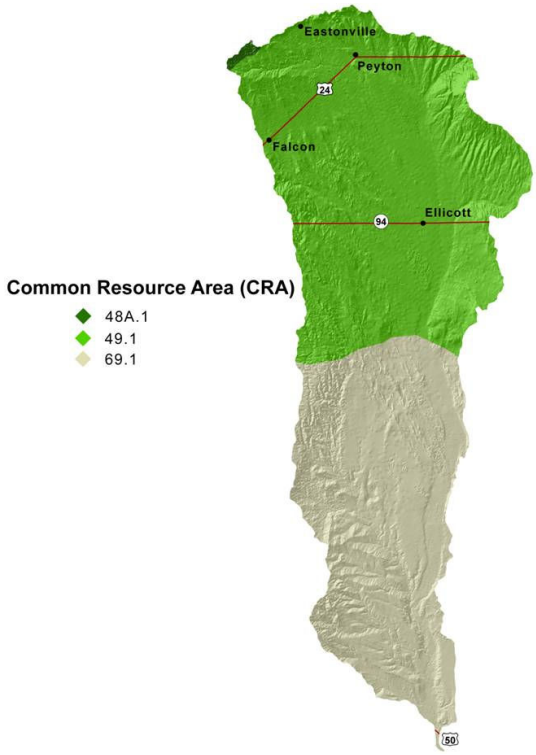




County	County Acres	County Acres in CHICO Watershed	% of County in the Watershed	% of Watershed in the County
El Paso	1,362,117	370,211.6	27.2%	79.79%
Pueblo	1,533,605	93,772	6.1%	20.21%

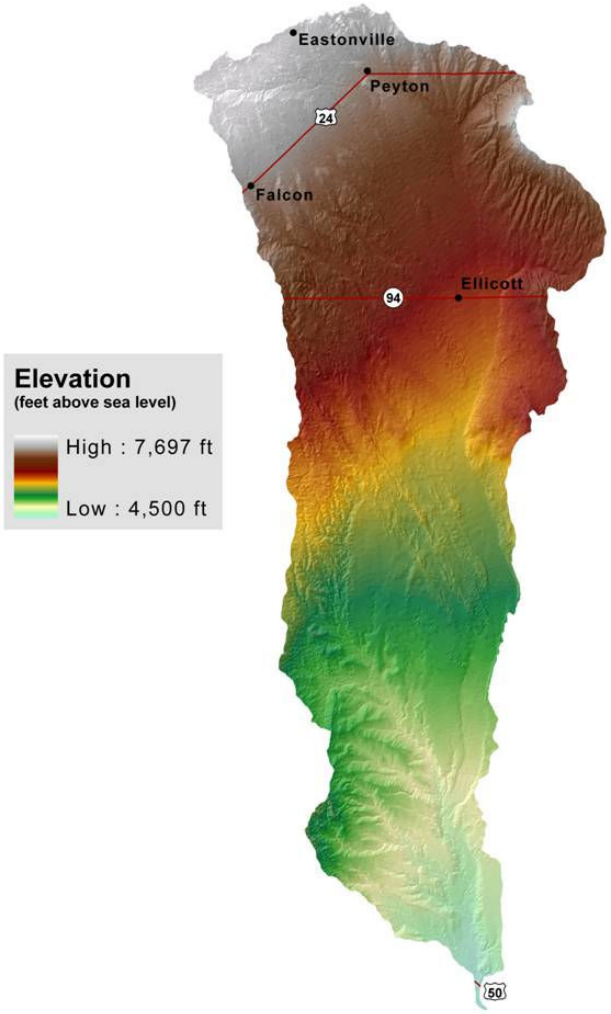
Chico Watershed - 11020004





Common Resource Areas (CRA): Geographical areas where resource concerns, problems, and treatment needs are similar. Landscape conditions, soil, climate, human considerations, and other natural resource information are used

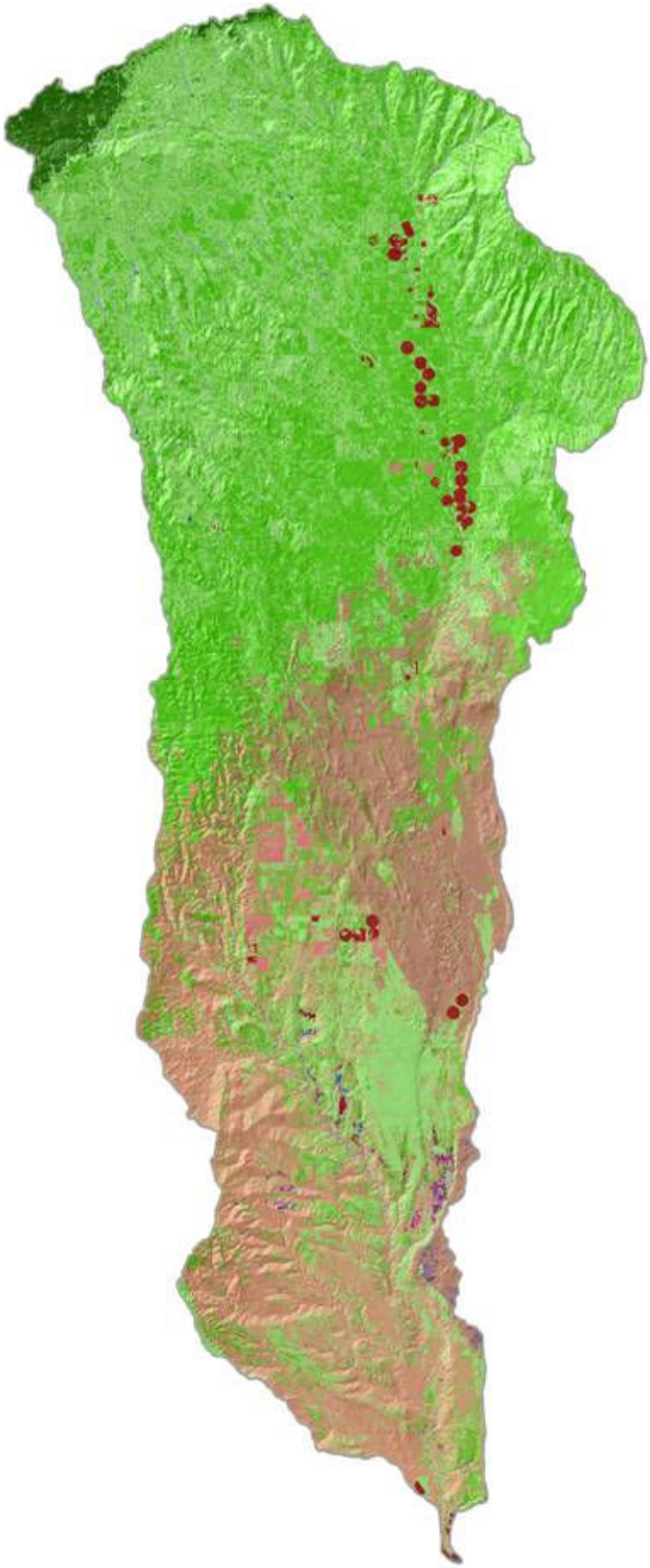
MLRA	CRA	CRA NAME	CRA DESCRIPTION
48A	**48A.1**	Southern Rocky Mountains - High Mountains and Valleys	This area is best characterized by steep, high mountain ranges and associated mountain valleys. The temperature regimes are mostly frigid and cryic; moisture regimes are mainly ustic and udic. Vegetation is sagebrush-grass at low elevations, and with increasing elevation ranges from coniferous forest to alpine tundra. Elevations range from 6,500 to 14,400 feet.
49	**49.1**	Southern Rocky Mountain Foot hills	This area is generally a transition between the Great Plains and the Southern Rocky Mountains. The temperature regime is mesic or frigid, and moisture regime is ustic. Characteristic native vegetation ranges from grasslands and shrubs to ponderosa pine and Rocky Mountain Douglas fir forest.
69	**69.1**	Upper Arkansas Valley Rolling Plains	The Upper Arkansas Valley Rolling Plains CRA is broad, undulating to rolling shale plains occurring along the upper tributaries of the Arkansas River. Local relief reaches 200 feet. Soils are shallow to deep and formed in loess, aeolian, alluvial and outwash materials. Pre-settlement vegetation was short grass prairies and pinyon and juniper stands on the stony and rocky soils. Nearly all of this area is in rangeland. Small areas of irrigated cropland occur along the floodplains and terraces.



Land Owner	Acres
Bureau of Land Management	48
Department of Defense	8,668
State of Colorado	157,510
Private	297,758

Vegetation

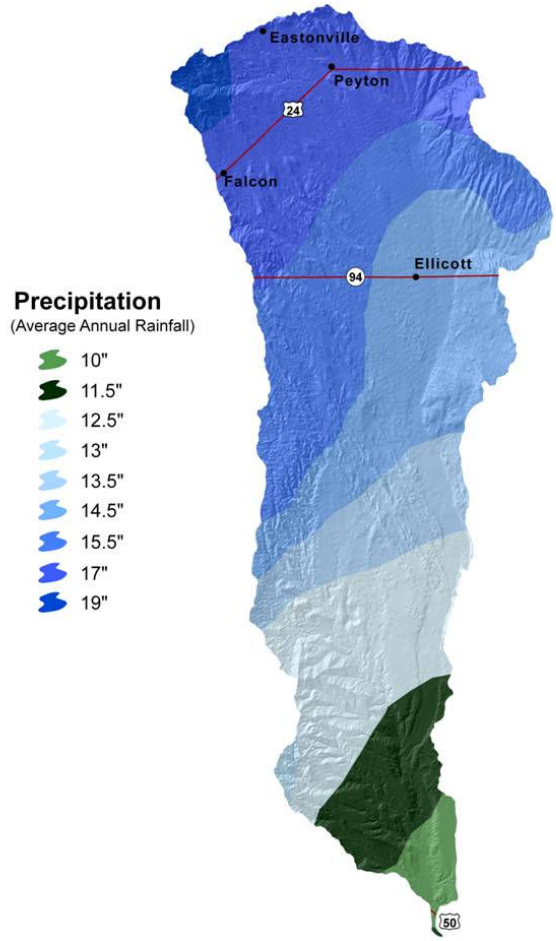
- No Data
- Urban/Built Up
- Residential
- Commercial
- Dryland Ag
- Irrigated Ag
- Grass Dominated
- Grass/Forb Mix
- Sparse Grass/Blowouts
- Sagebrush Community
- Saltbrush Community
- Greasewood
- Shrub/Grass/Forb Mix
- Sagebrush/Grass Mix
- Grass/Misc. Cactus Mix
- Grass/ Yucca Mix
- Pinyon-Juniper
- Gambel Oak
- Xeric Mountain Shrub Mix
- Mesic Mountain Shrub Mix
- Sparse PJ/Shrub/Rock Mix
- Sparse Juniper/Shrub/Rock Mix
- Ponderosa Pine
- Ponderosa Pine/Douglas Fir Mix
- P.Pine/Gambel Oak Mix
- Rock
- Soil
- Riparian
- Forested Riparian
- Cottonwood
- Shrub Riparian
- Herbaceous Riparian
- Water



CHICO Land Use	Total Acreage	Vegetation	Acreage
Cropland	6,506	Dryland Ag	2,257
		Irrigated Ag	4,249
Rangeland/Grassland	446,943	Gambel Oak	37
		Grass Dominated	153,121
		Grass/Forb Mix	152,573
		Grass/Misc. Cactus Mix	80,541
		Grass/Yucca Mix	5
		Greasewood	1,376
		Mesic Mountain Shrub Mix	1
		Pinon Juniper	<1
		Sagebrush Community	485
		Sagebrush/Grass Mix	55,637
		Saltbrush Community	4
		Shrub/Grass/Forb Mix	423
		Soil	11
		Sparse Grass/Blowouts	2,723
		Sparse PJ/Shrub/Rock Mix	5
		Xeric Mountain Shrub Mix	<1
Forest	6,619	Cottonwood	1
		Pinon Pine/Gambel Oak Mix	40
		Ponderosa Pine	6,572
		Ponderosa Pine/Douglas Fir Mix	5
		Sparse Juniper/Shrub/Rock Mix	<1
Riparian	3,495	Forested Riparian	17
		Herbaceous Riparian	3,456
		Riparian	18
		Shrub Riparian	4
Water	369	Water	369
Other	49	Commercial	3
		Residential	<1
		Rock	2
		Urban/Built Up	32
		No Data	11
Total Watershed Acres			463,981

Precipitation

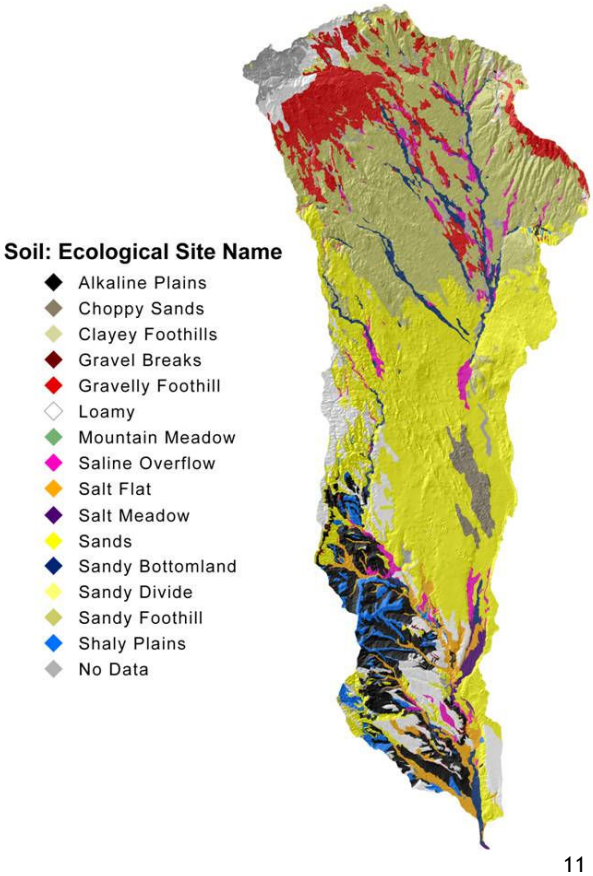
Droughts are regular visitors to the watershed as with the rest of Colorado. Statewide, in the 1900's alone, four prolonged dry spells occurred. There was one in the 1910s. Another, in the '30s, caused the dust-bowl period. The second worst drought on record in the state occurred in the mid-50s. A series of hot, dry summers following a period of scant mountain snowpack created water shortages. The fourth drought hit parts of Colorado in the late 1970s. In this century, the most severe drought since 1723 hit the state in 2002. Prior to the 1700's, researchers looking at tree ring records have found evidence of even more severe droughts, some lasting many years. Rainfall occurs as frontal storms in the spring and early summer and high intensity, convective thunderstorms in late summer. Maximum precipitation is from mid spring through late autumn. Precipitation in winter is snow. The average annual temperature is from 45 to 55 degrees F. The frost free period averages 162 days but ranges from 133 to 191 days.

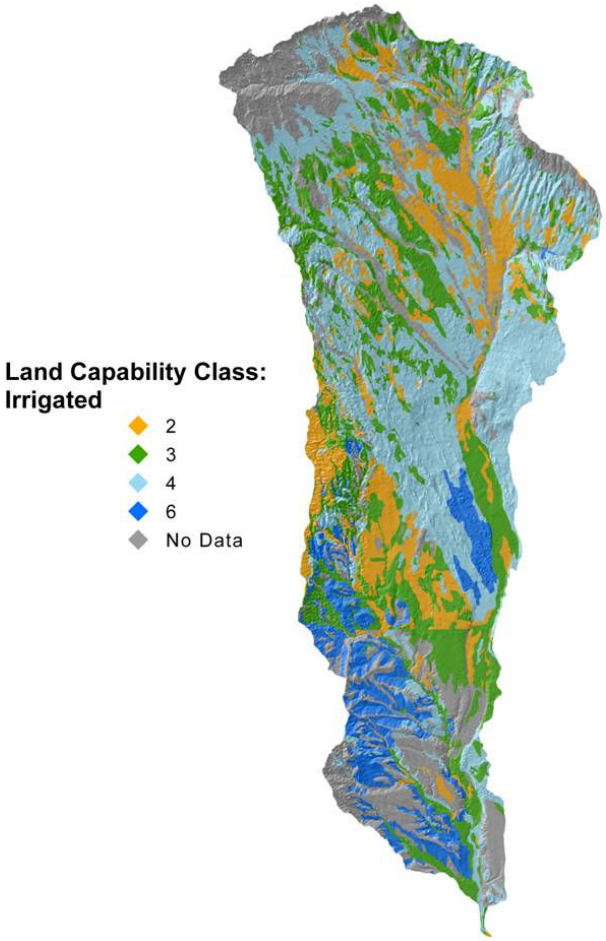


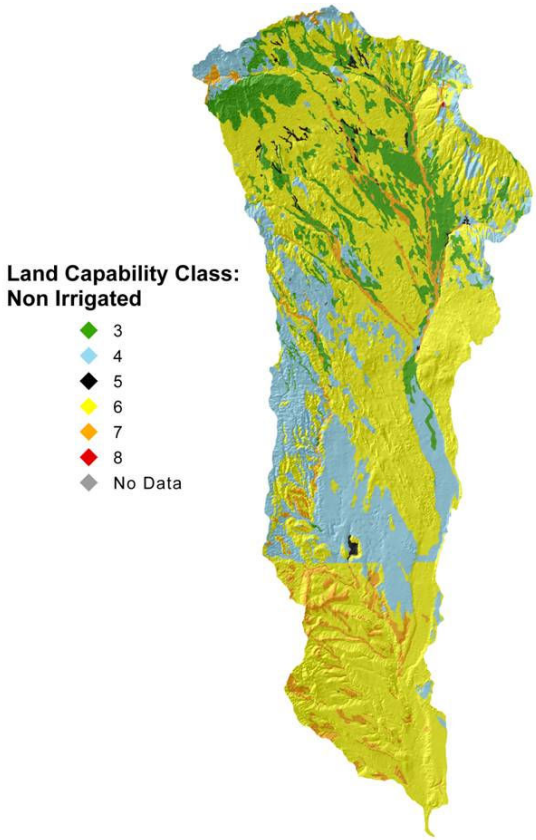
Ecological Sites

The plant community on an ecological site is typified by an association of species that differs from that of other ecological sites in the kind and/or proportion of species or in total production.

Ecological Site maps give an overall indication of the soils plant relationship in the area. More detailed descriptions of ecological sites are provided in the Field Office Technical Guide (FOTG). The FOTG is available in local offices of the Natural Resources Conservation Service (NRCS) and online at http://www.nrcs.usda.gov/technical/efotg/.







Land Capability Classification

Class 1 - soils have few limitations that restrict their use.

Class 2 - soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class 3 - soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.

Class 4 - soils have very severe limitations that reduce the choice of plants or that require very careful management, or both.

Class 5 - soils are subject to little or no erosion but have other limitations, impractical to remove, that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.

Class 6 - soils have severe limitations that make them generally unsuitable for cultivation and that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.

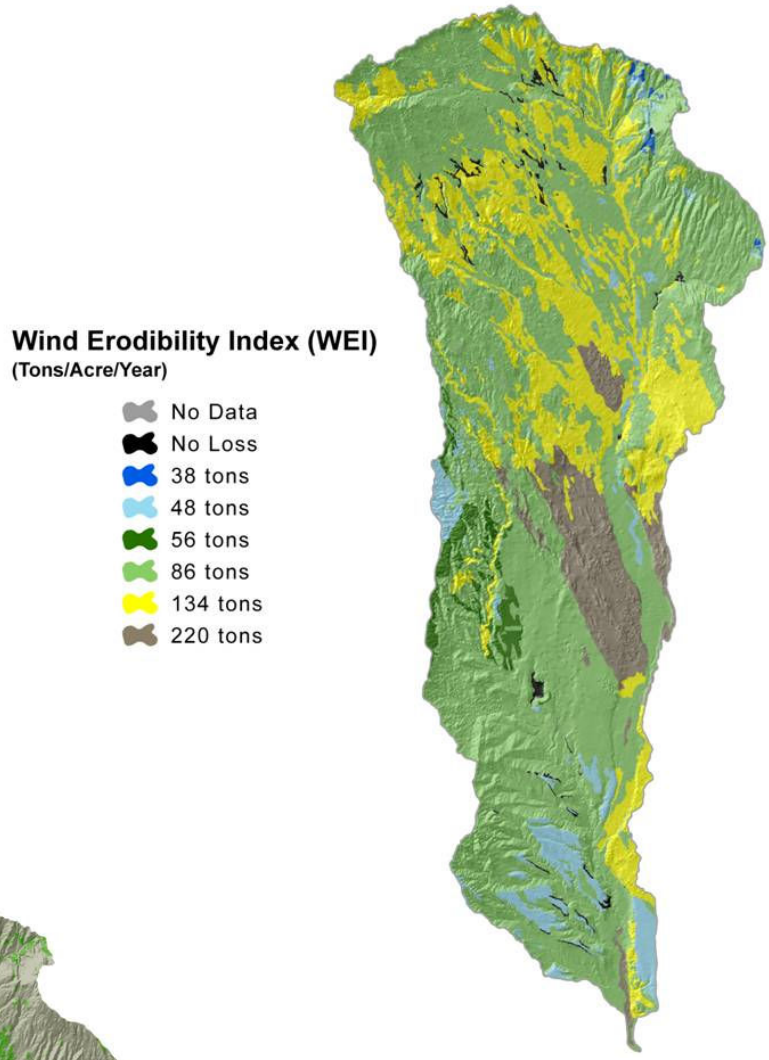
Class 7 - soils have very severe limitations that make them unsuitable for cultivation and that restrict their use mainly to grazing, forestland, or wildlife habitat.

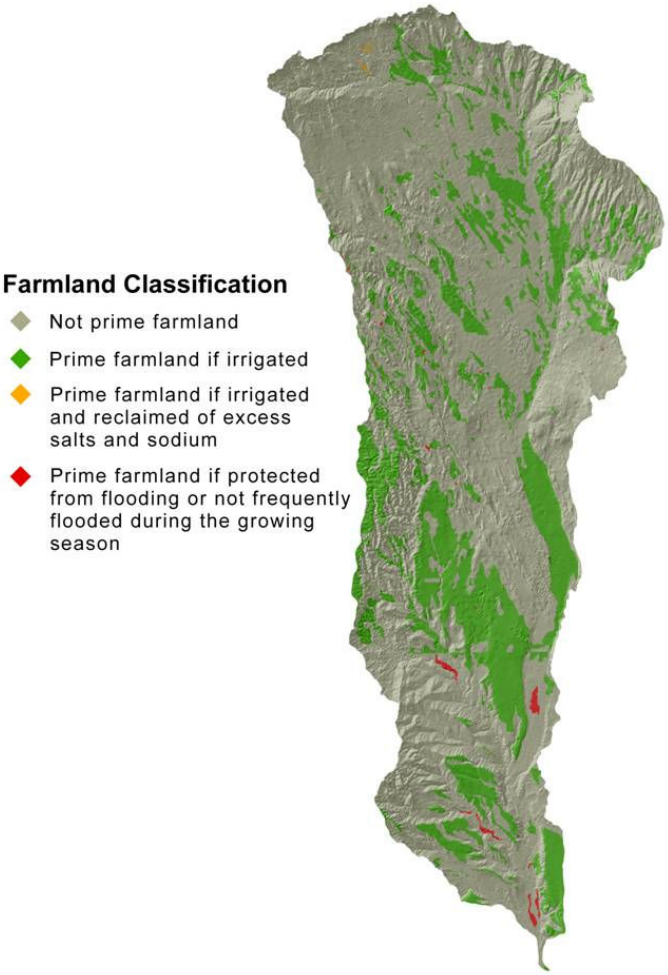
Class 8 - soils and miscellaneous areas have limitations that preclude commercial plant production and that restrict their use to recreational purposes, wildlife habitat, watershed, or aesthetic purposes.

The Wind Erodibility Index (WEI), is a numerical value indicating the susceptibility of soil to wind erosion, or the tons per acre per year that can be expected to be lost to wind erosion if it is assumed there is no vegetative cover or management.

Soils with an erodibility index equal to or greater than 8 are considered highly erodible.

As shown on the Wind Erodibility Index map, most soils in the Chico Watershed are highly erodible.





State and Federal Threatened, Endangered, and Candidate Species and Species of Special Concern in Chico Watershed

Common Name	Scientific Name	Class	State Status/Federal Status	Comments
Arkansas Darter	*Etheostoma cragini*	Fish	Threatened/Candidate	Occurs in the watershed
Bald Eagle	*Haliaeetus leucocephalus*	Birds	Threatened/None	May migrate through watershed and may winter near Arkansas River
Black-footed Ferret	*Mustela nigripes*	Mammals	Endangered/Endangered	No current records of occurrence
Black-tailed Prairie Dog	*Cynomys ludovicianus*	Mammals	Concern/None	Occurs in the watershed
Burrowing Owl	*Athene cunicularia*	Birds	Threatened/None	Occurs in the watershed
Ferruginous Hawk	*Buteo regalis*	Birds	Concern/None	Occurs in the watershed
Flathead Chub	*Platygobio gracilus*	Fish	Concern/None	Occurs in Arkansas River at mouth of watershed
Long-Billed Curlew	*Numenius americanus*	Birds	Concern/None	Occurs in the watershed
Massasauga	*Sistrurus catenatus*	Reptiles	Concern/None	May occur in the watershed
Mountain Plover	*Charadrius montanus*	Birds	Concern/None	Occurs in the watershed
Northern leopard frog	*Rana pipiens*	Amphibians	Concern/None	Occurs in the watershed
Plains Leopard Frog	*Rana blairi*	Amphibians	Concern/None	Occurs in the watershed
Preble's Meadow Jumping Mouse	*Zapus hudsonius preblei*	Mammals	Threatened/Threatened	May occur in the watershed
Swift fox	*Vulpes velox*	Mammals	Concern/None	Occurs in the watershed
Triploid checkered whiptail	*Cnemidophorus neotesselatus*	Reptiles	Concern/None	May occur in the watershed
Flathead chub	*Platygobio gracilus*	Fish	Concern/None	May occur in the watershed

Shortgrass prairie is the dominant terrestrial habitat type in this watershed. Burrowing owl, mountain plover, black-tailed prairie dog, and swift fox are representative species for this habitat. Water is scarce and the native species in this watershed are those that can survive without abundant water supplies. Riparian areas, playa lakes, and the occasional stock pond provide seasonal to intermittent aquatic habitats. Economically important wildlife species that occur in the watershed include black bullhead, green sunfish, pronghorn (antelope), mule and white-tailed deer, mourning dove, and scaled quail. Turkey, bobwhite quail, and pheasant occur in the Arkansas River corridor near the mouth of the watershed.

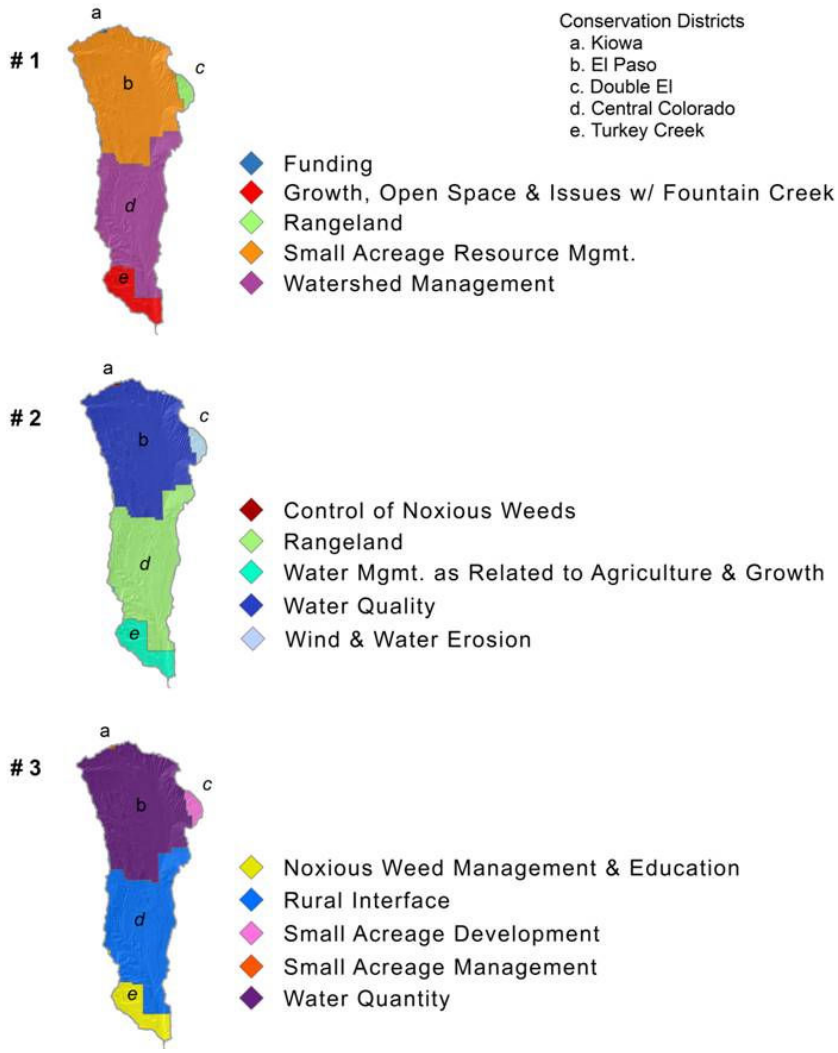
Social Data		
	ElPaso	**Pueblo**
Demographics (US Census, American Factfinder)		
Total population	550,130	147,187
Male	272,922	71,711
Female	277,208	75,476
Median age (years)	33.5	36
White	444,799	120,922
Black or African American	33484	2046
American Indian and Alaska Native	4855	1647
Asian	15516	1072
Native Hawaiian and Other Pacific Islander	1241	202
Some other race	29575	16496
Hispanic or Latino (of any race)	70312	58024
Economic Characteristics (US Census, American Factfinder)		
In labor force (population 16 years and over)	288,867	72,727
Median household income (dollars)	50,714	37,305
Median family income (dollars)	61,719	45,765
Per capita income (dollars)	25,261	19,668
Families below poverty level	x	x
Individuals below poverty level	x	x
X means that value is not applicale or not availiable		
County Agricultural Characteristics (Colorado Agricultural Census, county data tables)		
Farms (number)	1175	801
Land in farms/ranches (acres)	811,931	774,352
Average size farm/ranch (acres)	691	967
Median size farm (acres)	160	175
Average age of farmer or rancher	54.1	55.5
Net cash return from ag sales ($1,000)	2,485	5,788
Cattle and calves (number)	26,000	33,000

Resource Concerns Identified by Conservation Districts

Resource Concern By Priority	Soil Erosion	Rangeland	Water Quality	Water Quantity	Invasive Plants	Wildlife Habitat	Urban Growth
a. Kiowa	5	3			4	2	
b. El Paso			4	3	2		5
c. Double El	4	5		1		2	3
d. Central Colorado		5			3		4
e. Turkey Creek				4	3	2	5
Totals	9	13	4	8	12	6	17

Notes:

The Conservation Districts identified and prioritized these resource concerns during facilitated public meetings held between 1998 and 2000 and are part of the Conservation District's Long Range Plans. Higher scores indicate higher priority



Selected Conservation Application Data	Chico Watershed — 11020004						
	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total
Total Conservation Systems Planned (Acres)	45,968	105,972	na	96,682	12,808	6,680	268,110
Total Conservation Systems Applied (Acres)	3,800	0	na	86,322	51,129	16,706	157,957
Practices Applied							
Prescribed Grazing	49,021	0	274	74,002	0	16,523	139,820
Upland Wildlife Habitat Management	85	0	23	12,257	0	16,523	28,888
Conservation Cropping System	0	0	0	946	0	175	1,121
Residue Management	27	0	0	946	0	175	1,148

Conservation Systems to Address Major Resource Concerns

Primary Resource Concern:	**Rangeland Health**			
Conservation System Description:	Prescribed Grazing—planned management that provides adequate recovery opportunity between grazing events and proper stocking of animals..			**Based on Conservation System Guide Code:** CO 67B.1-GR-01-R-Grazing
Practices	**Unit**	**Quantity**	**Cost/Unit ($)**	**Estimated Cost ($)**
Prescribed Grazing				
Fence (382)	Ft.	30,000	0.6	18,000
Pest Management (595)	Ac.	400	6,000	6,000
Pipeline (516)	Ft.	18,000	2.40	43,200
Upland Wildlife Habitat Management (645)	Ac.	na	na	
Watering Facility (614)	No.	3	600	1,800
Windbreak/Shelterbelt Establishment (380)	Ft.	1,300	.85	1,105
Subtotal: Rangeland costs	Median Size Ranch— 6,500 acres	23	70,105	**$1,612,415**

Resource Concern:	Soil Erosion By Wind	
Conservation System Description:	Seasonal residue management with Conservation crop rotation, Nutrient and Pest Mgt	Reference Conservation System Guide Code: CO 67B.1-CR-Dryland-R-1

Practices	Unit	Quantity	Cost/Unit ($)	Estimated Cost ($)
Conservation Crop Rotation (328)	Ac	1000	5	5,000
Residue Mgmt, Mulch Till (345)	Ac	2000	15	30,000
Nutrient Management (590)	Ac	1000	5	5,000
Pest Management (595)	Ac	2500	15	37,500
Subtotal: cropland costs				**77,500**

General Effects, Impacts, and Estimated Costs of Application of Conservation Systems

Landuse	Resource	Measurable Effects	Non-measurable Effects	Cost ($)
Rangeland	Plants		Improved plant condition, productivity, health and vigor. Grazing animals have adequate feed, forage, and shelter.	1,612,415
Dryland Crop	Soil	8,000 Total Tons/Year saved	Cropland sustainability	77,500
			Total Costs	**$1,689,915**

References Not Cited in Document

303(d) listed streams within Big Sandy Watershed were created using data from Colorado Department of Public Health & Environments' Water Quality & Control Commission. Impaired streams are current as of April 30, 2006. For a list of all Colorado impaired streams, locations and priority ratings, visit http://www.cdphe.state.co.us/regulations/wqccregs/100293wqlimitedsegtmdls.pdf.

Threatened and Endangered Species information was gathered using data from the Colorado Division of Wildlife (CDOW) Natural Diversity Information Source (NDIS).

Resource Concerns were identified using the Colorado Association of Conservation Districts' (CACD) long range (10 year) plans from the period of 1996-2000. For more information on Colorado's Conservation Districts, visit http://www.cacd.us.

Maps were generated using Soil Survey Geographic Database (SSURGO) tabular and spatial data. SSURGO data was downloaded for the following Colorado surveys:

El Paso County Area (CO625) Published 12/19/200

Pueblo Area (CO626) Published 12/19/2005

Vegetation data was generated using the Colorado Division of Wildlife's "Colorado Vegetation Classification Project" (CVCP) data. visit http://ndis.nrel.colostate.edu/coveg.

Common Resource Area (CRA), a subdivision of the Major Land Resource Area (MLRA), is a geographical area where resource concerns, problems, or treatment needs are similar. For more information on Common Resource Areas visit http://soils.usda.gov/survey/geography/cra.html.

Average Annual Precipitation data was developed through a partnership between the Natural Resources Conservation Service's (NRCS) National Water and Climate Center (NWCC), the National Cartography and Geospatial Center (NCGC), and the PRISM (the Parameter-elevation Regressions on Independent Slopes Model) group at Oregon State University (OSU), developers of PRISM. Mean annual precipitation maps were developed calculating averages of rainfall for the period of 1961-1990. For more information visit http://www.ncgc.nrcs.usda.gov/products/datasets/climate/docs/fact-sheet.html or http://www.ocs.orst.edu/prism.

Land Ownership (status, 2004 dataset) data was obtained from the Colorado Department of Transportation (CDOT). For more information, visit http://www.dot.state.co.us.

Relief & Elevation maps were created using the National Elevation Dataset (NED), 30m Digital Elevation Model (DEM) raster product assembled by the U.S. Geological Survey (USGS). The data was downloaded from the NRCS Geospatial Data Gateway at http://datagateway.nrcs.usda.gov.

Conservation Systems to address major resource concerns were extracted from the Conservation Systems Guides (CSG) compiled from local conservationists by the NRCS Ecological Sciences Section at the Lakewood State Office.

Effects and Impacts of application of conservation systems were extracted from Colorado eFOTG, Section III, Resource Quality Criteria, NRCS, Colorado, March 2005.